

WHAT IS CLAIMED IS:

1                   1.       An isolated sweet taste receptor comprising a T1R3 polypeptide,  
2 wherein the T1R3 polypeptide is encoded by a nucleotide sequence that hybridizes under  
3 moderately stringent hybridization conditions to a nucleotide sequence encoding an amino  
4 acid sequence of SEQ ID NO:15, 20, 23, or 25.

1                   2.       The isolated receptor of claim 1, wherein the T1R3 polypeptide is  
2 encoded by a nucleotide sequence that hybridizes under highly stringent hybridization  
3 conditions to a nucleotide sequence encoding an amino acid sequence of SEQ ID NO:15, 20,  
4 23, or 25.

1                   3.       The isolated receptor of claim 1, wherein the T1R3 polypeptide has an  
2 amino acid sequence of SEQ ID NO:15, 20, 23, or 25.

1                   4.       The isolated receptor of claim 1, wherein the receptor comprises a  
2 T1R3 polypeptide and a heterologous polypeptide.

1                   5.       The isolated receptor of claim 4, wherein the T1R3 polypeptide and the  
2 heterologous polypeptide are non-covalently linked.

1                   6.       The isolated receptor of claim 4, wherein the T1R3 polypeptide and the  
2 heterologous polypeptide are covalently linked.

1                   7.       The isolated receptor of claim 4, wherein the heterologous polypeptide  
2 is a T1R1 polypeptide that is encoded by a nucleotide sequence that hybridizes under  
3 moderately stringent hybridization conditions to a nucleotide sequence encoding an amino  
4 acid sequence of SEQ ID NO:1, 2, or 3.

1                   8.       The isolated receptor of claim 4, wherein the heterologous polypeptide  
2 is a T1R1 polypeptide that is encoded by a nucleotide sequence that hybridizes under highly  
3 stringent hybridization conditions to a nucleotide sequence encoding an amino acid sequence  
4 of SEQ ID NO:1, 2, or 3.

1                   9.       The isolated receptor of claim 7, wherein the T1R1 polypeptide has an  
2 amino acid sequence of SEQ ID NO:1, 2, or 3.



- 1 18. The antibody of claim 17, wherein the antibody specifically binds to a  
2 taste receptor comprising T1R1 and T1R3.
- 1 19. The antibody of claim 18, wherein the T1R1 polypeptide and the T1R3  
2 polypeptide are non-covalently linked.
- 1 20. The antibody of claim 18, wherein the T1R1 polypeptide and the T1R3  
2 polypeptide are covalently linked.
- 1 21. The antibody of claim 17, wherein the antibody specifically binds to a  
2 taste receptor comprising T1R2 and T1R3.
- 1 22. The antibody of claim 21, wherein the T1R2 polypeptide and the T1R3  
2 polypeptide are non-covalently linked.
- 1 23. The antibody of claim 21, wherein the T1R2 polypeptide and the T1R3  
2 polypeptide are covalently linked.
- 1 24. A method of identifying a compound that modulates sweet taste signal  
2 transduction in taste cells, the method comprising the steps of  
3 (i) contacting the compound with a sweet taste receptor comprising a T1R3  
4 polypeptide, wherein the T1R3 polypeptide is encoded by a nucleotide sequence that  
5 hybridizes under moderately stringent hybridization conditions to a nucleotide sequence  
6 encoding an amino acid sequence of SEQ ID NO:15, 20, 23, or 25; and  
7 (ii) determining the functional effect of the compound upon the receptor,  
8 thereby identifying a compound that modulates sweet signal transduction.
- 1 25. The method of claim 24, wherein the T1R3 polypeptide is encoded by  
2 a nucleotide sequence that hybridizes under highly stringent hybridization conditions to a  
3 nucleotide sequence encoding an amino acid sequence of SEQ ID NO:15, 20, 23, or 25
- 1 26. The method of claim 24, wherein the receptor comprises a T1R3  
2 polypeptide and a heterologous polypeptide.
- 1 27. The method of claim 25, wherein the T1R3 polypeptide and the  
2 heterologous polypeptide are non-covalently linked.



- 1 38. The method of claim 36, wherein the receptor is linked to a solid  
2 phase.
- 1 39. The method of claim 36, wherein the functional effect is determined by  
2 measuring binding of a compound to the receptor.
- 1 40. The method of claim 39, wherein the functional effect is determined by  
2 measuring binding of a compound to the extracellular domain of the receptor.
- 1 41. The method of claim 24, wherein the receptor is expressed in a cell or  
2 cell membrane.
- 1 42. The method of claim 41, wherein the functional effect is a physical  
2 effect.
- 1 43. The method of claim 42, wherein the functional effect is determined by  
2 measuring ligand binding to the receptor.
- 1 44. The method of claim 43, wherein the functional effect is determined by  
2 measuring binding of a compound to the extracellular domain of the receptor.
- 1 45. The method of claim 41, wherein the functional effect is a chemical or  
2 phenotypic effect.
- 1 46. The method of claim 45, wherein the functional effect is determined by  
2 measuring changes in intracellular cAMP, IP3, or  $\text{Ca}^{2+}$ .
- 1 47. The method of claim 41, wherein the cell is a mammalian cell.
- 1 48. The method of claim 47, wherein the cell is a human cell.
- 1 49. A method of identifying a compound that modulates sweet taste signal  
2 transduction in taste cells, the method comprising the steps of  
3 (i) contacting the compound with cell expressing a sweet taste receptor  
4 comprising a T1R3 polypeptide and a T1R2 polypeptide, wherein the T1R3 polypeptide is  
5 encoded by a nucleotide sequence that hybridizes under highly stringent hybridization  
6 conditions to a nucleotide sequence encoding an amino acid sequence of SEQ ID NO:15, 20,  
7 23, or 25; and wherein the T1R2 polypeptide that is encoded by a nucleotide sequence that

hybridizes under moderately stringent hybridization conditions to a nucleotide sequence encoding an amino acid sequence of SEQ ID NO:7, 8, or 9; and  
(ii) determining the functional effect of the compound upon the receptor, thereby identifying a compound that modulates sweet signal transduction.

50. The method of claim 49, wherein the T1R2 polypeptide and the T1R3 polypeptide are non-covalently linked.

51. The method of claim 49, wherein the T1R2 polypeptide and the T1R3 polypeptide are covalently linked.

52. A method of identifying a compound that modulates sweet taste signal transduction in taste cells, the method comprising the steps of

(i) contacting the compound with cell expressing a sweet taste receptor comprising a T1R3 polypeptide and a T1R1 polypeptide, wherein the T1R3 polypeptide is encoded by a nucleotide sequence that hybridizes under highly stringent hybridization conditions to a nucleotide sequence encoding an amino acid sequence of SEQ ID NO:15, 20, 23, or 25; and wherein the T1R1 polypeptide that is encoded by a nucleotide sequence that hybridizes under moderately stringent hybridization conditions to a nucleotide sequence encoding an amino acid sequence of SEQ ID NO:1, 2, or 3; and

(ii) determining the functional effect of the compound upon the receptor, thereby identifying a compound that modulates sweet signal transduction.

53. The method of claim 52, wherein the T1R1 polypeptide and the T1R3 polypeptide are non-covalently linked.

54. The method of claim 52, wherein the T1R1 polypeptide and the T1R3 polypeptide are covalently linked.